

Learning and Catching Up: China's RMA Initiative

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“Revolution in Military Affairs” (RMA) has become the biggest challenge to China's economic development and military modernisation at the turn of the new millennium. To the Chinese political and military leaders RMA is not only a new military theory, it also promises a new type of war of mass destruction, as they saw in the Gulf War, the Kosovo War and the on-going war against terror. The Chinese leadership has genuine reasons to be worried. The countries most vigorously advancing RMA and most capable of bringing the theory into reality are all China's potential opponents. The US in particular is using RMA to consolidate its military superiority in the decades to come.¹ Worse still, for the foreseeable future the PLA will have limited capabilities to deal with hi-tech wars brought about by RMA. In addition it is difficult for China to achieve the breakthroughs in military technology necessary for speeding up its defence modernisation. It is likely that China may be left further behind, as RMA helps the United States achieve a new qualitative leap in its power projection capabilities in the new century. Exactly because of the gravity of this issue to China's long term national security the PLA has shown enormous enthusiasm for learning and absorbing RMA in its effort to catch up. If China can successfully translate the RMA concepts into its strategic guideline, weapons programs and force restructuring, the PLA will, given time, take on an entirely new look. If this happens, the whole Asia-Pacific region will feel the consequences.

Embracing the Revolution in Military Affairs

The Chinese military researchers learned the concept of the RMA as early as the 1970s when they noticed Soviet military circles discussing a revolution in military technological affairs. At the same time the new Soviet term caused consternation in the US defence community. They thought that the USSR was signalling that it had obtained some superiority over the US through scientific and technological breakthroughs. Only later did the Americans discover that the Soviet research on revolution in military technological affairs was actually aimed at studying the innovations in US military thinking, which had been stimulated by technological innovations. The systematic study of the linkage between technological advancement and military affairs by both superpowers resulted in a foresighted prediction that a revolution in information technology would fundamentally transform the way the war was pursued.²

The RMA has been brought to prominence only recently by the military actions in the 1990s, such as the *Desert Storm* and the Kosovo War, which revealed the new dimensions of combat. However, the Chinese seriously studied the discussion of RMA in the US and USSR as early as

¹ Li Jijun, “Xinjunshi gemin yu zhanlie siwei de biange” (RMA and changing strategic mentality), *The Journal of PLA National Defence University*, January 1999, p. 20.

² Cheng Bojiang, William Perry and others, “Junshi gemin yu meiguo kua shiji de guofang fazhan” (RMA and US defence development in the century beyond), *The Journal of PLA National Defence University*, December 1998, p. 50.

the 1980s. Since then they have published a large number of books and articles on RMA, anticipating that something revolutionary may soon happen in military science and armed conflict.³ Immediately after the official adoption of Deng Xiaoping's "people's war under modern conditions" in the early 1980s, the Central Military Commission (CMC) launched a nationwide campaign to study how the PLA would fight in the turn of the century. In 1987 strategists in the PLA Academy of Military Science stated that a qualitative change in military science was in the making, the change brought about by the development of a new hi-tech conventional armory, such as laser and direct energy weapons and information systems. The effect of the hi-tech weaponry was increasingly approaching that of nuclear missiles.⁴ In his keynote speech to the PLA's first all-Services conference on the future war in 1986, General Zhang Zhen warned that if the PLA could not foresee the developmental trend of military science, it would be further left behind.⁵ Since the mid- 1990s the concept of RMA has attracted enormous interest in the rank of file of the PLA, which just witnessed the prototypical application of RMA ideas by the US in actual wars. In a sense, China is fortunate to have been exposed to such international events and technological revolution at a time when its leadership is under minimal ideological constraint. The unprecedented level of political relaxation has permitted PLA researchers to take a realistic approach to the study of war. The RMA related subjects have become compulsory courses in all PLA educational institutions. Now it has actually become a vogue for PLA soldiers to talk about RMA. Andrew Marshall and other key advocates in the West have been quoted frequently.

Such zeal to learn the RMA has surprised many western analysts for two reasons. The first is that RMA is an invention by the advanced military powers but is now embraced so enthusiastically by a China whose technological foundation can hardly sustain any real PLA attempts to put the RMA into practice. Second, it is a surprise due to China's traditional propensity against the West's ideological penetration. This has told a lot of the PLA today which is much more open and pragmatic. As pointed out by Michael Pillsbury, the PLA's elaboration of the RMA has shaken up western notions about the backwardness of the PLA's strategic planning. Indeed, the very fact that the RMA is seriously studied in China is an indication of the PLA's advance; besides the Chinese, only Americans and Russian wrote on the subject in the early 1990s.⁶

The RMA and the Internal Debate

Yet not all PLA leaders embrace RMA ideas. Currently there are three schools of thoughts in the PLA, each debating with the other two over what should be the best strategic guidelines for China's future military modernisation.⁷ The first school of thought is that of "people's war" composed by the remaining Long Marchers and their close associates still in active service. With reservations about RMA they contend that the concept is far away from the PLA's reality. They

³ An early book was published in 1987, which carried articles by a large number of senior PLA generals. It is entitled *Tongxiang shengli de tansou* (Exploring the ways towards victory), edited by a special research team, Beijing: the PLA Publishing House, 1987.

⁴ Liu Jishan and Qian Zunde, *Dangdai waiguo junshi sixiang* (Contemporary military ideas in foreign countries), Beijing: the PLA Academy of Military Science Press, 1987, p. 32.

⁵ Zhang Zhen, "Guanyu wojun zhanyi lilun de jige wenti" (Some questions concerning PLA campaign theory), Editor Group (eds), *Tongxiang shengli de tansou* (Exploring the ways towards victory), Beijing: the PLA Publishing House, 1987, p. 16. At the time he was president of the National Defence University and by the 1990s had become the second highest ranking officer in the PLA.

⁶ Pillsbury, cited in *Far East Economic Review*, 24 July 1997.

⁷ Gao Chunxiang, *Xinjunshi gemenlun* (On RMA), Beijing: The PLA Academy of Military Science Press, 1997, p. 15.

believe that given China's present backward military technology, the PLA has no choice but to depend on the people's power, and its current equipment, to frustrate any enemy's invasion.⁸ The number of people in this school of thought is the smallest among the three. Yet their argument cannot be entirely dismissed: the US's defeat in Vietnam and the Soviet disgrace in Afghanistan showed that the form of people's war is not without its logic in the defence of a continental country. The US is fearful of casualties. Therefore, the usefulness of people's war has not been exhausted against a land war threat of the superpower even in the hi-tech era. It is interesting to note that they are watching closely the current US war in Afghanistan. If a new form of operations based on the hi-tech weapons can be successfully carried out against the Taliban, they would have to rethink the effectiveness of guerrilla warfare in the information age. Certainly, the influence of the Long Marchers is continuously dwindling. Even people in this school have realised that what China may face in a future war is not an invasion on its land mass but either surgical air strikes or sustained air and missile bombardment, as seen in Kosovo in 1999. People's power can do little under these circumstances.

At present, the majority of PLA generals belong to the school of hi-tech warfare. Led by powerful military leaders such as Admiral Liu Huaqing, former vice chairman of the CMC, (retired in 1997), these senior officers man key PLA positions and run its daily affairs. This school of thought sees the key importance of equipping the PLA with as much hi-tech weaponry as possible, despite the fact that China has not yet entered the information age and does not have a solid technological foundation for practising the RMA. Their view is similar to the prediction of US analysts that RMA can happen in China only after the second decade of the 21st century.⁹ In addition to the factor of time, this school, although emphasizing the role of "systems of systems" in the PLA's modernisation, differs from the school of the RMA, in that the latter takes a more integrated view on the features of information warfare (IW). Furthermore, people in this school do not envisage an urgent need for a fundamental overhaul of China's armed forces in the foreseeable future. They agree to a major restructuring of the PLA, giving priority to the development of the specialised Services, such as the air force and navy.¹⁰ Yet they dismiss the idea of creating digital divisions and constructing a digitalised battlefield as relevant to China's situation. For instance, they believe that it is too early to think of replacing the current verticle C³I system that links the CMC, seven military regions and a number of war zones with a new integrated five-dimensional C³I system (Land, sea, air, space, and electronic space). The new system is horizontally distributed and removes the existing functional divisions of command between geographical locations and different Services. In other words, while acknowledging the changing patterns, modes and processes of war, this school of thought values only isolated aspects of IW.¹¹ China's current national defence strategy bears the name of this school of thought whose specific features are discussed in the later section.

In contrast, the RMA school of thought theoretically tends to aggregate all the features of hi-tech wars and analyses these features in a progressive manner. The number of "true believers" of the

⁸ Sun Jizhang, "Tantan zhanfa de texin" (On the pattern of war), *The Journal of PLA National Defence University*, January 1999, p. 47.

⁹ Liu Honji, "Lun youzhongguo tese de xinjunshi gemin" (On RMA with Chinese characteristics), *The Journal of the PLA National Defence University*, nos. 2-3, 1998, p. 62.

¹⁰ See for instance, Liu Yicang, *Gaojishu zhanzheng lun* (On hi-tech war), Beijing: Junshi kexue chubanshe, 1993, chapter 4.

¹¹ Information gathered in China through interviews with PLA officers in 1999.

RMA in the PLA is small and clearly many of them are simply copying the attitudes of their US colleagues without a real grasp of the concept. These enthusiastic supporters of the RMA are war planners in the headquarters of PLA Specialised Services and the academic staffs in PLA education and research institutions. It is they who have spearheaded the study of advanced western military ideas and convinced PLA top brass that times have changed. They are young, well read, visionary, and anxious to create a new PLA that is more professional than revolutionary.¹² They favour China's modernisation but reject its wholesale westernisation. They entertain strong nationalist feelings but oppose "closed-doorism". More interestingly, they see communism as irrelevant to China's goal of self-strengthening but accept the Chinese Communist Party (CCP) as the vehicle for the realisation of that national goal. Painfully conscious of their country's present state of military backwardness, they seem to harbour a suppressed ambition that may explode in hawkish rhetoric concerning China's sovereignty disputes. In the years to come they will wield increasingly more influence within the PLA and even over national politics as a whole. Partly, this is due to their strategic positions in the PLA headquarters at various levels. In PLA tertiary institutions they are teaching the future PLA leaders and forging personal networks with them. More importantly, their views on the RMA stem from their understanding of technological development in the new century. This has won them the firm support of the Chinese leader Jiang Zemin who, as a farsighted technocrat himself, is very enthusiastic about the RMA. The fundamental reason that the RMA has become so popular in the PLA, is because its advocates tend to be promoted more quickly, with Jiang's blessing.¹³ It is safe to predict that when these people are in senior commanding posts later this decade, the future development of the PLA will be guided more visibly by the ideas of the RMA.

The significance of the existence of the three schools of thoughts is that, before technocrats took over the leadership in the CCP and military, technology was only one of the changing variables in the formulation of national defence strategy. The "generalists"-dominated leadership had a natural tendency of belittling the role of technology, as reflected by Mao, who eyed nuclear bombs as paper tigers. Now, the technocrats have a real grasp of the technological revolution and consciously direct military decision-making processes based on new technological innovations. Over time, this has resulted in the Party's new political line of transforming the PLA from a quantitative to qualitative military, discarding a long PLA tradition that identified strength with numbers. As one senior PLA theorist commented: It is inevitable that a military has to evolve from drawing physical strength from numbers (tineng) to relying on technological hardware (jineng) to eventually becoming a military of intelligence (zhineng).¹⁴

However, what should be mentioned here is that the three schools of thought have not created deep cleavages in the PLA. The PLA has a general consensus that the information age will profoundly affect its war preparation, and the technological breakthroughs in the world have visibly altered the way wars are fought. All PLA personnel agree that China needs to adapt to this change. At the same time they take useful elements of each school to guide the strategic

¹² On this point, see You Ji, "China: From A Tool of Revolution to A Professional Military", in Muthiah Apalagapa (ed.) *The Professionalism of Asian Armed Forces*, Hawaii, East-West Centre Press, 2001, pp. 93-110.

¹³ These officers have written a large number of books and articles concerning the RMA, some of which are cited in this paper. These articles are sometimes commissioned by the senior officers for policy debate. Now all top generals have their "personal think tanks" whose primary task is to contribute new ideas. The RMA discussion is a major source of these ideas. Many of them have been incorporated into policy guidelines after a period of debate. Others are the reflections of the authors' reading of Western literature on the topic.

¹⁴ *The PLA Daily*, 8 March 1991.

planning. The idea of “people's war” is regarded as still valid in some circumstances, e.g. in a territorial conventional war against an invading enemy. The hi-tech strategy school of thought is for dealing with limited regional wars, the main type of action China envisages. In such a scenario, the PLA will rely on its hi-tech capable elite units, especially the Specialised Services, to execute its war plans. At the moment, this is probably all the PLA can do with its limited amount of hi-tech hardware. In the future, when China has achieved solid technological foundation and the PLA has overcome its current equipment dearth, it will be better able to implement the ideas of the RMA, utilising advanced military satellites, miniature super computers, and well developed IT networks to digitalise its armed forces. So the RMA school of thought is, for now, more a philosophical blueprint than a practical roadmap for China's defence. It is the incremental growth in China's comprehensive national strength that can make the RMA a real guide for the PLA's war preparation, thus unifying the thinking of its high command.

Understanding RMA

For the time being the PLA has worked hard to understand the effects of RMA on the military establishment. In 1998 the PLA National Defence University convened a major workshop on RMA, during which participants worked out their definition of the concept. It was made up of five revolutions: those of military thinking, military technology, military equipment, strategic theory, and force structure.¹⁵ More concretely, the core of the RMA is information technology and a key form of RMA is information warfare. The efforts of force restructuring, weapons development, and the training of soldiers are all guided by the progress of information technology. The evolution of the RMA is indicated by the progress of the establishment of digitalised troops as well as the construction of the digitalised battlefield. In addition, the emergence of the RMA reflects a larger revolution in social and economic areas that gradually ushers mankind into a new stage of development. For the PRC, this is a great test that will decide China's future: whether it can follow this historical trend by further reforming its political system to emancipate the minds of the people..

In a way the RMA workshop has played an important role in systematizing the PLA's efforts to embrace RMA. What exactly has the PLA learned? Major General Chen Youyuan, director of the Officers' Training Bureau in the General Staff Department, summarises the key features of the RMA, as understood by the PLA. According to him, the RMA is profoundly altering the world military in the following ways:

- * The RMA is changing the components of the armed forces, especially for the campaign formation between different services;
- * The RMA is introducing new means of combat;
- * The RMA is generating a much larger combat space;
- * The RMA is creating new modes of operations;
- * The RMA is inventing new methods of combat engagement.

¹⁵ Zhang Hui, "Xinjunshi gemin enti yanjiu xinlun" (New ideas in the study of RMA), *The Journal of the PLA National Defence University*, nos. 2-3, 1998, p. 67.

All this in turn propels the military to make theoretical breakthroughs so as to accommodate these new developments in technology and combat operations. In his view China has, together with other major powers, entered an exciting era of new military thinking, ideas and concepts. Thus, whoever fails to follow the RMA will be beaten in the future wars.¹⁶

In studying the RMA, PLA thinkers have indeed come up with a number of new ideas that they wish to incorporate into their long-term planning for the modernisation of China's armed forces. The following are some of their findings:

- * Strike from long distance. New sophisticated terminal guidance systems and precision weapons have made possible attacks from beyond the range of vision. This will minimise human engagement and greatly reduce casualties. PLA researchers have studied the US's new concepts of combat such as "disengagement and indirect assault", and "concentrated firepower but dispersed manpower". They accept the claims by US military experts that in the distant future tank battles, aircraft "dog-fights" and naval gun battles will have become history.¹⁷

- * Small-sized battle formation without compromising the strength and outcome. Crack force structure and simple-layer C⁴I systems are more suitable for IW, which is more characterised by combat between hardware/software than between men. Digitalised and precision ammunition have multiplied the firepower capability of campaign units. Therefore, a small hi-tech force can overpower an army ten times more numerous. Digitalisation is, in particular, a key indicator of a military of the future. It provides a high level of battlefield transparency to the side which has the means of multi-dimensional intelligence acquisition.¹⁸

- * Linkage between superiority in information and operational victory. Information technology has not only become an indispensable means for command and communication, it has also constituted an effective weapon to be used to kill the enemy directly. Combat between opposing militaries is, first of all, one between their capabilities to gather, process, and analyse information. Combat engagement begins long before soldiers shoot at one another, and it may have become physically invisible interaction. That is to say attacks at the enemy's nerve centres can be achieved without using aircraft, warships and missiles. They can be carried out simply through computer virus and software bombs to paralyse its C⁴I systems. Superiority in information technology amounts to superiority in combat operation.¹⁹ Indeed, the PLA's effort in this regard has caught the attention of an American professor at the Armed Forces Staff College who commented: "the Chinese defence analysts appear to be at the cutting edge of the implications of information war for traditional institutions such as the military."²⁰

The RMA with Chinese Characteristics

¹⁶ Chen Youyuan, "Junshi jishu gemin yu zhanyi lilun de fazhan" (RMA and the development of campaign theory), *The Journal of PLA National Defence University*, January 1999, pp. 37-38.

¹⁷ Ibid.

¹⁸ Hu Yongfeng and others, *Shuzhihua budui yu zhanchang* (Digitalised troops and battlespace), Beijing: Junyi chubanshe, 1998.

¹⁹ Li Qingshan, *Xinjunshi gemin yu gaojishu zhanzhen* (New revolution in military affairs and hi-tech warfare), Beijing: The PLA Academy of Military Science Press, 1995, Chapter 5 & 6.

²⁰ Ehsan Ahrat, "Chinese Prove to Be Attentive Students of Information Warfare", *Jane's Intelligence Review*, October 1997, p. 472

In addition, the Chinese are not only learning the RMA. The most pressing question asked in the RMA convention was how to fit the PLA in this inevitable worldwide evolutionary process. This provided the crucial linkage between the study of the RMA and its application in the PLA's war preparation. PLA researchers insist that unless the RMA concepts can be "Sinified" according to China's traditions, current practices, and future needs, the effort of learning the RMA will be led astray.²¹ At the philosophical level, the RMA is not seen merely as a military concept. According to Professor Zhu Guangya, China's top defence scientist, the RMA is the product of socio-economic and technological development. The emergence of this concept in the US, and its adaptation in China, reflect a worldwide developmental trend of the post-industrial age. The RMA is the organic and timely combination of advanced weapons systems, new military theoretical guidelines, and a suitable force structure. This combination can generate a qualitative change in the employment of military power. However, without a full grasp of the deeper political, philosophical and economic meanings of the RMA, it is difficult to work out the correct timing and organic framework for the combination of the three crucial factors.²² Along this line of thinking, PLA researchers argue that blind acceptance of the American RMA will induce people to think that it is mere physics or computer science that wins the war. If the US is the only RMA standard, China, which is technologically inferior, will have no hope to learn and apply RMA ideas in practice. The key reason for Sinifying the RMA is that it will be doomed to failure if an inferior military organization copies by rote the emerging force structure and combat patterns of an advanced opponent. In other words, to many PLA strategists the RMA should not simply be a technological privilege endowed only to a superpower.²³

Therefore, the PLA sees a need to create its own way of applying the concept of RMA to its military modernisation. This is what PLA researchers define as injecting Chinese characteristics into RMA.²⁴ More concretely, the PLA believes that the application of RMA ideas and practice must suit its tradition and current situation as a strategically defensive force with inferior weaponry. This can be seen from China's effort to develop tactics of, and means for, asymmetric warfare (see below). In the minds of PLA researchers, the American RMA is based on equipping US soldiers with both advanced hardware and software to maximize their offensive capabilities in a global setting. For the PLA, the RMA, in the short run, is to offer the soldiers with a set of force amplifiers such as limited systems of intelligence, surveillance and reconnaissance and to place them in an improved command and control network. The goal is that when these force amplifiers are introduced to a low-tech military, its combat effectiveness would be greatly enhanced in a regional setting and in defensive war scenarios. . At least at this stage, China is not bent on acquiring the kind of precision warfare and global strike capabilities that are intended as a core component of the US RMA. One of the practical objectives of applying the RMA concept in war fighting is to explore ways (Chinese ways) to protect the homeland against the enemy's

²¹ As Emily Goldman and Tom Mahnken rightly pointed out, the idea of Sinifying RMA is a very intriguing one. They asked "when we think about how the RMA is being adapted abroad, should we think about 'Japanising' the RMA and 'Singaporising' it?" This is a good question. In my opinion, when the RMA is being adapted outside the US, it would inevitably create new variations to suit local conditions. However, whether the new variations are significant enough to warrant such a definition is open for debate. In most cases, it does not. There are American scholars who see the difference between "a general RMA" and "an American RMA". See for instance, John Battilega's paper to the conference on Conventional Arms Rivalry in the Asia-Pacific, October 24, 2001, Hawaii, organised by the Asia-Pacific Center for Security Studies.

²² Wang Gezhen and Li Mindtang, "Junshi geming souyi" (Some discussion on the revolution in military affairs), *The Journal of the PLA National Defence University*, no. 11, 1997, p. 22.

²³ Li Jijun, p. 22.

²⁴ Liu Honji, p. 62.

remote-controlled attack, and to wage a counter-attack against the enemy's own homeland through various means, including cyber warfare.

It is important to point out that the Chinese believe that the RMA is still in its formative years with its initial phase extended to 2030,²⁵ therefore, it is difficult to see its full potential. To the PLA, however, it is easier to talk about catching up than to actually do so. One precondition for the success of catching up is to have a correct understanding of what the RMA means, especially, of what it means to Chinese military modernisation. In order to meet the challenge, the PLA has worked out a number of principles of learning the RMA. The first task is to further unfetter the minds of its commanders and constantly upgrade its war-fighting theories. Senior officers have argued that, although the RMA is driven by the revolution in military technology, new technology itself will not automatically produce new theoretical guideline for the PLA's war preparation. Without new combat theory, technology cannot win the war by itself. Moreover, new theory will not be invented without a fundamental change in the mentality of PLA soldiers.²⁶ In fact, the RMA is seen not only as bringing pressure to bear on the PLA, but also as opening up new opportunities for it: the RMA provides a stimulant for the PLA to shake off its historical burdens rooted in its revolutionary ideology and dated military strategies.

Secondly, the PLA makes it an urgent task to follow closely the major military powers' new theories and practices. This is regarded to be of crucial importance to implement the instructions of Jiang Zemin to win the next hi-tech war.²⁷ The PLA now believes that the recent limited hi-tech wars have provided good case studies for China to understand the logic, operational features, and combat patterns of its potential adversaries. These should serve as useful references for the PLA to design counter-measures, such as how to withstand a sustained air attack, or how to neutralize aircraft carriers. At the same time, the PLA is using these cases as a guide to develop its own combat theories and principles.

Thirdly, the PLA believes it should study IW carefully in order to learn its merits and, simultaneously, find its points of weakness. This is crucial for the PLA, which will for a long time rely on inferior weapons to fight powerful enemies. One important learning mission the PLA has assigned to its research institutions is to study the Kosovo conflict thoroughly. These institutes have analysed how the NATO air attack was hampered by poor weather conditions and difficult terrain, why the Yugoslavia's integrated air defence system could not shoot down a significant number of invading aircraft, and why the NATO forces failed to inflict a high level of casualties on Yugoslavian forces, and what lessons the PLA could draw from this one-sided warfare, which may be the PLA's lot in a future conflict.²⁸ Today the "War Against Terror" is also closely watched, as this entirely new war may have significant impact on the PLA's engagement with potential opponents. In the final analysis, to most PLA generals the RMA is no longer a theoretical concept but a type of warfare for which China has few countermeasures. This further highlights the need for the PLA to study the ideas related with the RMA.

²⁵ Zhang Hui, p. 67.

²⁶ Chen Youyuan, p. 38.

²⁷ General Qian Guoliang, commander-in-chief of Jinan Military Region, "Shiying tizhi bianzhi gaige xintedian yichuangxin jingshen tuijin budui zhiliang jianshe" (Conform to the new changes brought about by the structural adjustment and quicken the quality improvement with a creative spirit), *Journal of the PLA National Defence University*, no. 8, 1999, p. 33.

²⁸ Chen Xianhua, deputy commander-in-chief of Chengdu Military Region, "Chuangxin he fazhan gaojishu tiaojian xia renmin zhanzheng zhanlie zhanshu" (Innovate and develop people's war strategy and tactics under the hi-tech war conditions), *Journal of the PLA National Defence University*, no. 12, 2000, p. 21.

Injecting RMA into the Hi-tech Defence Strategy

The PLA's embracing of RMA has provided a timely guideline for it to improve its new national defence strategy, both in theory and in practice. This is a major attempt to Sinify RMA according to its own defence requirements. Now more than ever, PLA generals have been convinced that winning a hi-tech war relies on hardware superiority, sound tactics, and a suitable force structure. They have also realised that Deng's "people's war under modern conditions" fomented confusion regarding the basic direction of the PLA's development. Conceptually, it has become self-contradictory, conflating two very different strategies of relying on population resources (luring the enemy into the heartland and engaging it in a protracted people's war) on the one hand and on firepower (modern conditions, namely withholding the enemy in key war directions by the professional armed forces on the other. The doctrine of "active defence", the concrete form of Deng's strategy, which was designed at the beginning of the 1980s to withstand a Soviet land attack through positional warfare, seemed to have been out of step with the evolution of international affairs soon after it was approved.²⁹ Then, the strategy of fighting a limited regional war, formulated in the second half of the 1980s in dealing with China's border disputes, was regarded as providing no long term guide for the PLA to address its security concerns and practical needs for weapons systems. That is to say, that China as a major world power cannot base its military modernisation simply on considerations of the potential conflicts in the South China Sea or along its borders.³⁰

Therefore, at the beginning of the 1990s, China was experiencing a vacuum in national defence strategy. Fortunately for the PLA, the Gulf War erupted and supplied the Chinese a concrete image of what the future of war would look. Jiang Zemin summarised his grasp of the future of military affairs during his inspection tour of the PLA National University of Science and Technology in 1991. He asserted that a future war would be a war of high technology, a war of multiple dimensions, a war of electronics, and a war of missiles. The PLA had to be ready for such a reality.³¹ Since then, Jiang has laboured to build a consensus within the top civilian and military leadership regarding China's national defence strategy in the post-Cold War era. Officially approved by the CMC in 1992; this new strategy is titled "*fighting a future war under hi-tech conditions*", which, while remedying the traditional doctrinal defects, laid the groundwork for force restructuring, general training and formulation of "war game" plans to counter China's potential threats.

What is the relationship between Deng Xiaoping's doctrine of "fighting a people's war under modern conditions" and the post-Deng strategy of "fighting a future war under hi-tech conditions"? The latter has clearly evolved from the former but brought it much closer to the political and security reality of the information age. Both envisage active defence to hold an enemy's invasion at bay rather than luring it into the heartland. Both prefer advanced military hardware to manpower and call for building a high-quality standing army. Both highlight the

²⁹ "Active defence strategy" was first raised by the four star general Su Yu on 11 January 1979 to a group of senior PLA officer at the PLA Academy of Military Science. See, Su Yu, "Dui weilai fanqinlie zhanzheng chuqi zouzhan fangfa jige wenti de tantao", *Junshixueshu*, no. 1, 1979, pp. 1-12.

³⁰ For more detailed analysis, see You Ji, *The Armed Forces of China*, Sydney: Allen & Unwin, 1999, chapters 2 and 7.

³¹ *The PLA Daily*, 20 March 1991.

need for launching united operations in contemporary warfare, emphasising the decisive role of the Specialised Services, especially the air force.

Yet drawing on the crucial elements of the RMA theory, the hi-tech strategy differs from Deng's strategy in several important respects. First, the former calls for establishing a linkage between active defence and forward defence, which may mean power projection beyond the country's land borders. This is a radical departure from Deng's active defence, which was confined to territorial defence in a form of positional warfare around major cities. Deng's defence is "active" only compared to Mao's passive "people's war". Forward defence is the key to the new strategy, as it recognises that in a hi-tech war the enemy can strike from a long distance, a key component of the RMA. For instance, PLA researchers repeatedly quote the example that the advancement of military technology in the 1970s, as reflected by the development of long-range precision weapons, allowed NATO to attack the Soviet second and third echelon formations from afar. This denied Moscow's initiative of launching a large-scale conventional war in West Europe. Previously, NATO could only plan for a war of attrition against the preponderant Soviet ground force. The PLA has noticed that with RMA unfolding, the line dividing the front and rear has become blurred. This has forced the PLA to greatly enlarge its strategic depth, which, according to PLA war planners, should not be restricted to China's borders. For example, air and missile defence should be stretched even beyond the enemy's first line air base.³² To the PLA, enlarged defence depth may not prevent the enemy's long-range attack, but if the enemy can be effectively engaged in the outer defence line of the country, the PLA may at least pose a greater threat to the enemy. This could secure precious time and thus reduce the personnel and material losses on the defensive side.³³ Moreover, in geo-political terms, this forward defence can take the form of deployment in areas subject to overlapping territorial disputes. As an expression of sovereignty claims, this entails the permanent stationing of PLA units in, and regular military exercises around, these areas. In some extreme cases, this even entails a demonstration of war brinkmanship to protect China's vital national interests such as its sovereignty integrity.

Secondly, the hi-tech defence strategy is largely an offensive-oriented strategy, reflecting the PLA's shifting emphasis towards the "active" versus the "defensive" side of war preparation. In a way, this is a reverse of Deng's doctrine. The PLA was quick to learn immediately after the Gulf War that hi-tech wars will not be fought along fixed defence lines. The line between battleground frontier and the logistical tail will become quite thin. Trench warfare will become rare. According to this change, some PLA strategists argue that China's post-Cold War military guideline should be changed from Deng's *yifang weizhu fangfan jiehe*, or "defence as overall posture, offence as the supplement", to *linghuo fanying gong fang jiehe*, or "adroit response based on a combination of offensive and defensive capabilities". Offence is now understood as capturing the nature of information warfare: the evolving hi-tech hardware is decisively in favour of a fast, offensive strike. In addition, technological innovation has increasingly blurred the boundaries between offensive and defensive weaponry. Indeed, RMA is about how to maximise the offensive effects. The digitalised battlefield, electronic soft kill, and pinpoint elimination of

³² Guo Yongjun, "Fangkong zuozhan ying shuli quanquyu zhengti fangkong de sixian" (Air defence should be guided by the theory of area and integrated defence), *Junshi xueshu*, no. 11, 1995, pp. 47-49.

³³ Since the war against Vietnam in 1979, casualties have become a sensitive political issue in China. Many people questioned whether it was worth the effort to attack Vietnam, considering the losses. Although the traditional thinking that victory should be the ultimate consideration regardless of human sacrifice still holds in the military, the PLA is under increased pressure to minimize the human losses.

key enemy targets all indicate that it is the side which can seize the initiative that has the best chance of success. The relationship between an offensive posture and a pre-emptive strike is especially crucial for a weak military, like the PLA, at the beginning of a hi-tech war.³⁴

In practice, the post-Cold War uncertainties have required the PLA to enhance rapid reaction capabilities to cope with new sets of events, expected or unexpected. Under some circumstances active defence can mean pre-emptive offensive campaigns to neutralise an imminent threat.³⁵ PLA strategists argue that a country's need to protect its territorial integrity dictates a forward posture. Take Taiwan as an example. Here the Chinese are politically and diplomatically reactive to the efforts of the independence movement on the island. Militarily, however, the PLA has to develop a capability powerful enough to deter any such attempt by the Taiwan authorities. If this fails, it has to launch an offensive operation. Inevitably the PLA has to formulate its detailed attack plans based on its available offensive weaponry. More importantly, this propensity to employ military forces is closely linked to the concept of military deterrence at various levels of possible armed conflict. A strategy of deterrence against foreign invasion differs from that of safeguarding national sovereignty. Generally, a defensive oriented military strategy cannot make the latter credible. This is especially true when the political forces for separatism have the support of a hi-tech military.³⁶

Third, as RMA envisages changing combat methods in the near future, China's post-Deng defence strategy also leaves room for absorbing new technologically-induced innovations in military planning. Politically, the strategy is progressive as well. Its hi-tech focus aims mainly at defence against strategic concerns, namely the major powers. At the same time, the strategy is flexible in principle, catering to different scenarios, from all-out hi-tech wars to small-scale border conflicts. This is the PLA's response to China's fluid security environment. Militarily, China's post-Deng defence strategy is not just a change in doctrine. It is forward-looking, as it is geared to preparation for war in the new century. Therefore, it prescribes concrete measures for weapons programs, force organization, campaign tactics, and research priorities which do not aim at equipping the PLA in the next few years, but at the frontier of hi-tech breakthroughs some decades from now.³⁷

What is the significance of this new military thinking for the future? To RMA advocates, establishing the right direction of development in the long-term may be more important than the immediate availability of advanced hardware.³⁸ They point out that the importance of RMA does not lie in developing hi-tech equipment but in utilizing it. Without sound theoretical guidance, even if the PLA acquires sophisticated weapons in the new century, they cannot not be used

³⁴ Shi Zhigang, "Jiji fangyu zhanlie sixiang zhai xinshiqi junshi douzheng de tixian" (The application of active defence strategy in the military preparation in the new era), *The Journal of PLA National Defence University*, August-September 1998, p. 100.

³⁵ Ouyang Wei, "Lung guojishu jiubu zhancheng de zhanyixing zuozhan xintai" (The forms of campaign operations under hi-tech warfare conditions), *The Journal of the PLA National Defence University*, no. 4, 1995, p. 20.

³⁶ Gao Jinxi, "Duiguojia yujin xitong jianshe wenti de tansuo" (On the construction of the national early warning system), *Junshixueshu*, no. 3, 1995, p. 93.

³⁷ Tao Bojun, "Dangde sandai lingdao jiti yu keji qianjun" (The Party's three generation leadership and strengthening the armed forces through technological breakthroughs), *China Military Science*, no. 3, 1997, pp. 65-73.

³⁸ See articles in Pillsbury, Michael (ed.), *Chinese Views of Future Warfare*, Washington, US National Defence University, 1997.

scientifically to their full potential. Advocates illustrate their point through the following example: in the 1930s France and Germany had a similar number of tanks. While tanks were scattered in the French army, they were concentrated in the elite divisions of the German army, maximizing their potency in ground battles. The different deployment methods produced vastly different effects in the war, giving birth to a new revolution in military affairs.³⁹ This example has convinced the PLA that a good defence strategy, weapons development, and a suitable force structure form the three-in-one trinity to make the PLA powerful. Without all three, its modernisation will be led astray.

Putting RMA Ideas into Practice

Although the Chinese leadership has no illusions of how far the country is away from realising its RMA goals, it perseveres. Indeed, it has made small steps in following the direction of RMA in its drive for defence modernisation. At the moment, the PLA can do little, but it believes it is important to lay a solid foundation, both in theoretical and material terms, for the day when the country is capable of translating its RMA blueprint into reality. Below are examples of what the Chinese are doing to put its RMA ideas into practice.

Setting the national goal for hi-tech research

The RMA has become a driving force for the development of science and technology in China. The leadership concludes that without a sound technological foundation, there is no point in considering the RMA. China's hi-tech base is currently quite thin. Only in limited technological areas has China reached globally competitive levels, such as in its space industry. Yet market reform has gradually strengthened this weak foundation, as China's rapid economic growth makes the research for hi-tech weapons more affordable than before. However, the Chinese recognise the fact that it is too early to seriously contemplate the narrowing of the technological gap with the West. This is the reason why China feels vulnerable regarding RMA warfare. On the other hand, China's technocrats-turned leaders have made it a state policy to enter the hi-tech race with the major powers, although the policy does not put "guns" above "butter".⁴⁰ They have not failed to notice that the US technological race with the USSR helped it to achieve a superior position in the economic competition of the post-Cold War world. The new understanding is that defence related technology has always driven scientific innovation. The applications of military information technology can be wide-ranging and profitable.

Now hi-tech development is the top national priority. In concrete steps, China has devoted enormous resources to develop IT industries, which have been growing annually by over 30 percent in the last decade and are, in absolute terms, now the second largest in the world. This rate of growth will continue for another decade. Breakthroughs have been registered in many IT sectors. The super-computer is one example. The Shuguang-3000 is capable of 403.2 billion cycles per-second (GHz). In 2001 China developed the first CPU chip with independent property

³⁹ Xie Dajun, "Qiantan zhishi jingji jiqi dui junshi gemin de yingxiang yu tiaozhan" (The influence and challenge of knowledge economy to RMA), *The Journal of PLA National Defence University*, January 1999, p. 27.

⁴⁰ See, for instance, the "Decision on Advancing Technological and Scientific Research" by the Central Committee of the CCP, May 1995.

rights. Now it is capable of mass-producing high-digit megabit memory chips with 0.25 micron widths.

As a result, the research and development of weapons programs relating to the military space network, fixed-energy and laser equipment, and electronic weapons, have been built upon more solid technological bases. For instance, China is pursuing many of the requisite technologies necessary to producing an indigenous land-attack cruise missile. These technologies include new airframe design, propulsion systems (such as small turbojet engines and ramjet/scramjets), and guidance technologies (such as GPS for in-flight navigation and terrain contour matching guidance, imaging infrared, or synthetic aperture radar for terminal homing). China is also developing at least some low observability technology for reduced radar cross-sections and heat signatures.⁴¹ In addition, China's research and development of laser technology has enabled it to weaponise the research outcome.

The concept of "battlespace" is also embraced with great enthusiasm.⁴² By the 2005-2010 time-frame, China's space-based surveillance architecture could have at least four components: 1) synthetic aperture radar satellites for all weather, day/night monitoring of military activities; 2) electronic reconnaissance satellites to detect electronic emissions in the Western Pacific; 3) mid-high resolution electro-optical satellites for early warning, targeting, and mission planning; and 4) a new generation of high resolution recoverable satellites for intelligence and analysis.⁴³ The PLA believes that, ultimately, it will have to develop anti-satellite satellites or anti-satellite missiles in order to be able counter an enemy's "star war" initiative.⁴⁴ Logically, this effort demands a continuing and sizeable increase in military budgets, for hi-tech driven military modernisation is bound to be expensive.⁴⁵ Indeed, more funds will be allocated in the R & D of hi-tech weapons.

Initiating qualitative force restructuring

There is no doubt that, by now, both Chinese civilian and military leaders have firmly accepted the central theme of RMA: that in the information age, victory in war is predominantly dependent on the quality of technology, rather than quantity of men in uniform. With this consensus, the PLA has quickened its efforts to build a qualitative military by initiating large scale force reductions. The Army was ordered to let go 500,000 men in 1997. Already its size is the smallest since the founding of the PRC (1.6 million) but further cuts are likely to follow. Not only is the size scaled down, but also the structure has undergone significant change. Since 1999, a major reform has been conducted in the 24 group armies of the PLA. Over a dozen divisions have removed from the army structure, and a large number of divisions and regiments have been

⁴¹ Richard Bitzinger, "Going Places or Running in Place? China's Efforts to Leverage Advanced Technologies for Military Use", in Colonel Susan Puska (ed.), *People's Liberation Army after Next*, Strategic Studies Institute, US Army War College, 2000, p. 11.

⁴² China will launch over 30 satellites and a number of manned spacecraft in the next five years, according to Hu Hongfu, deputy general manager of the China Aerospace Industrial Group. *The People's Daily*, February 2001.

⁴³ Mark Stokes, "China's Military Space and Conventional Theatre Missile Development: Implications for Security in the Taiwan Strait", in Colonel Susan Puska (ed.), *People's Liberation Army after Next*, p. 113.

⁴⁴ Cui Longzhu, "Qiantan fangkong zuozhan" (On anti-air operations), *Journal of PLA National Defence University*, no. 11, 1999, p. 53.

⁴⁵ The increase of military budget of 2001 was a record 17 percent over that for 2000. The trend will continue.

downgraded to brigades and battalions. Therefore, a new force structure has appeared in the Army, namely, the group army-brigade-battalion, which represents a visible departure from its traditional structure of group army-division-regiment. The guiding principle is in line with RMA thinking: a smaller force and a simpler command chain. However, within the new force structure specialised technological strength has been upgraded. Units of missiles, aviation, communications, and electronic warfare have been increased in number.⁴⁶ In contrast to the reduced ground force, the Specialised Services continue to enjoy priority for modernisation. Enormous efforts have been made to consolidate the second-strike nuclear capabilities, create offensive air power and develop a blue water navy.⁴⁷

Restructuring progress has been made in other areas to match the PLA with the world trend of RMA, although the progress is slow, to the point of annoying party leader Jiang Zemin. So far, the most visible change in the top command structure was the establishment of a General Equipment Department (GED) immediately under the CMC in 1998, with the same ranking as the GSD. This department has taken over the functions of weapons R & D, testing, acquisition, allocation, and related matters. These tasks were formerly assumed by the various top agencies in the PLA headquarters. For instance, it incorporated the Department of Equipment in the GSD, and the administrative and operational missions of the State Commission on Science, Technology and Industry for National Defence (COSTIND) under the State Council, including all military R & D projects and procurement agencies in the General Logistical Department.

The significance of the creation of this GED can be seen from the following two angles. Firstly, it constitutes an effective measure to substantiate the hi-tech defence strategy. Without a sufficient amount of sophisticated hi-tech weaponry, the strategy will remain an empty shell. The new GED reflects the determination of the CMC to concentrate all resources it can to advance weapons R & D and to quicken the process of equipping combat units. Secondly, the Department is also a concrete step towards translating the theory of the RMA into practical application. For instance, the GED's task is to facilitate weapons R & D and acquisition in accordance with the requirements of "united warfare". One precondition for this is to rectify the current state of affairs in weapons development by different services, which are uncoordinated and produces weapons that cannot be integrated among the services. The outcome is the weakened capacity for the PLA to conduct joint campaigns. The GED has the power to oversee weapons programs in all services with an aim to make them serve the purpose of united warfare.

Implementing new campaign tactics

Closely linked to the PLA's adaptation of an RMA related national defence strategy is a new effort to implement new campaign tactics derived from the study of the likely forms of future wars. Lieutenant General Hu Changfa, deputy president of the PLA National Defence University made the following summary at an all-armed-forces conference on campaign theory in late 1996:

⁴⁶ Major General (political commissar of a group army), "Nuli tansou xintizhixia jiceng jianshe de tedian he geliu" (Make a good effort to study the new features and patterns of the new army structure), *Journal of the PLA National Defence University*, no. 8, 2000, pp. 50-52.

⁴⁷ Liu Zuoxin, "Kongzhong jingong zhanyi lilian goucheng he zhanyi zhihui chutan" (Initial research on the force structure and command for offensive air campaigns), *The Journal of the PLA National Defence University*, no. 10, 1995, p. 40.

The changes in the international strategic environment and the wide application of hi-tech in the military realm have posed an enormous challenge to the PLA. Now we are facing new forms of warfare, new opponents in future wars, new campaign tactics and new patterns of engagement in campaigns. How to win the next war under hi-tech conditions is our primary task of study.⁴⁸

To tackle this task the PLA has first identified the most likely forms of engagement in a hi-tech campaign. According to General Hu, there are two. The first is mobile operations and the second is united operations.⁴⁹ Mobile operations dictate a fundamental revision of the PLA's operational doctrine centred on the positional warfare and promotes a kind of mobile defence warfare. The PLA has realized that line defence belongs to the era of rifles, guns and tanks, featuring the short-range engagement. None-line defence represents the future, requiring long-range mobility and stifling attacks at the enemy's rear with precision missile and electronic bombardment. Inevitably, the campaign operations have to be supported by satellite guidance and multi-dimensional strike capabilities.⁵⁰

Therefore, the essence of mobile operations is "offensive oriented operations" (gongshi zuozhan), which will be the main form of the PLA campaign engagement with its opponents.⁵¹ To PLA theoreticians, mobile operations are seen as the key component of a campaign in the information age. Hi-tech limited wars are characterized by non-fixed war zones, fluid operation formats, and little distinction between the front line and the defence depth. Only through mobile operations will the PLA take the initiative in the conflict. Mobile operations are also required by China's strategic landscape. In the future campaigns the PLA may be confronted with, the mission will involve operating in multiple strategic directions and over a vast combat space. It must move very rapidly in order to establish regional superiority in terms of manpower and hardware.⁵²

Another dimension of the PLA's new campaign tactics is initiating joint operations. A joint operation is now seen as reflecting the basic nature of contemporary warfare. This is a new approach compared with the PLA's traditional emphasis on combined operations, its basic campaign contingency centred on ground combat. "Combined" refers to employment of different arms of services (junzhong) within the Army: units of tank, artillery, engineering, telecommunications, anti-chemical warfare and others, brought together to execute a ground campaign. Specialized Services such as the navy, the air force, and the missile force are, however, given only a minor role. This campaign form is in agreement with the level of China's overall military technology: the Specialized Services are left far behind in hardware development. For example, the PLA Air Force does not possess attack aircraft that can provide close support for the infantry. After all, the Chinese armed forces grew from the Ground Force and are consequently dominated by it. Now the PLA high command has realised that the time has

⁴⁸ Hu Changfa, "Guanyu gaojishu tiaojian xia jubu zhanzhen zhanyi lilun yanjiu de jige wenti" (Several key questions of the theory of hi-tech campaigns), *Journal of the PLA National Defence University*, no. 1, 1997, p. 33.

⁴⁹ Ibid, p. 34.

⁵⁰ Wang Qunbo, "Jidong zhanzhong de kungjun zuozhan zhidao" (The guideline for air force mobile campaigns), *Junshixueshu*, no. 12, 1994, p. 28.

⁵¹ Hu Changfa, p. 34.

⁵² The remarks of General Liu Jingsong, president of the PLA Academy of Military Science, in his interview with Li Bin. Li Bin, "Dangdai shijie junshi fazhan qishi jizhanlie qishi" (The developmental trend of the world military today and lessons learned from studying the trend), *Journal of the PLA National Defence University*, no. 8, 1999, p. 27.

come for the rectification of these flaws, both in campaign theory and typology. The Special Services have made progress in both theoretical guidance and hardware upgrading, allowing them to support joint operations. Their status has at least risen to parallel that of the ground force. More importantly, the future war scenario requires a more active role for the Specialized Services. According to Lieutenant General Hu, in China's future strategic war planning, landing operations of some scales will be the PLA's primary task, and landing operations have to be united operations, representing the basic form of the PLA's theatre campaign under hi-tech conditions.⁵³ In a joint landing exercise at the divisional level in East China in October 2001, the commander-in-chief was a naval officer who was temporarily appointed as a vice-chief-of-staff of the Group Army that constituted the main force of the exercise. He commanded all participating units from the navy, air force, and the missile force.⁵⁴ Although such developments are still not often seen in the PLA, it does represent a future trend.

The RMA as a Guide for the Design of Future Wars

The RMA has broadened the vision of the Chinese military in designing its future war guidelines. To the PLA, hi-tech not only generates strength, but also exposes the weakness of a superpower that can be engaged to the advantage of its opponents. The September 11th tragedy reflects the vulnerability of a mighty nation to a new kind of war. High technology is not perfect. This offers the opportunity for the PLA to contemplate a variety of asymmetrical warfare options for its self-protection.

Asymmetric Warfare: the Soft Kill of the Weak against the Strong

The PLA envisages that IT warfare using computer viruses and cyber attacks to disrupt the enemy's high-tech command and control systems will be an integral part of a 21st century RMA war, and is much cheaper than engaging well protected assets, such as a carrier group. For the first time, military powers with a weak hardware inventory have found mechanisms to deliver punches on the soft underbelly of the enemy's war machine. To some extent, the invisible war has already begun among some potential adversaries. The waves of attack on the web-sites in China and in the US following the EP-3 incident in April 2001 depicted an embryonic form of such warfare which will become more widespread and intensified if a major conflict takes place.

In a way, preparation for the IT warfare will be what the PLA does in building up a "counter-revolution in military affairs" in a future war.⁵⁵ The form of this "counter-revolution in military affairs" warfare is likely a kind of asymmetric warfare that the PLA would be involved in with its potential enemies. The PLA strategists do have a realistic assessment of its vulnerability in a major war. Therefore, the top command will not likely commit its soldiers in the real battles against the major powers, for example, ordering its naval fleets in a high-intensity sea battle with the US Seventh Fleet. On the other hand, when it feels forced to respond against an imminent threat, it may choose a number of options that it believes to be more cost-effective than dispatching troops to the scene. PLA strategists are inclined to think that in the information era, the more a military depends on electronics for winning the war, the more vulnerable it may

⁵³ Hu Changfa, p. 34.

⁵⁴ *The PLA Daily*, 20 November 2001.

⁵⁵ Thomas Christensen, "Posing Problems without Catching Up: China's Rise and Challenge for US Security Policy", *International Security*, Vol. 25, no. 4, 2001, p. 25.

become when facing a protracted attack on its information hubs. As one PLA researcher from the National Defence University pointed out, about 80 percent of US military communications facilities are built upon civilian networks and this opens the way for an effective cyber attack.⁵⁶ If enough damage is inflicted onto the superpower, the US may be forced to limit its war objectives. In the case of Taiwan, it may exercise pressure on the Taiwan leaders to refrain from attempting to declare independence. Therefore, the concept of counter-RMA provides a useful guide for the PLA to contemplate how a weak military deals with a more powerful one.

Ultimately however, the PLA will not be satisfied simply to interrupt the enemy's information networks, but to actually win the information war, which is regarded as the chief form of warfare in the 21st century. As firepower gradually becomes secondary to information power in importance, the PLA is calling on its people to change their basic sense of war in the new age.⁵⁷ The fighting power of one nation is no longer assessed by only calculating its number of service personnel, tanks, aircraft, warships and even missiles. Dominance of information will be a crucial factor in deciding the outcome of war, but the victory is largely won in the operations rooms. China is devoting much of its resources to the build-up of weapons without smoke, weapons such as electromagnetic pulse devices, laser guns, electronic jamming equipment, and computer viruses and hackers to attack the enemy's networks.⁵⁸

Asymmetry Warfare: the Missile Threat

The PLA sees missile attack as a very useful weapon of asymmetry warfare with which a weak military can engage a strong one. Saturated conventional missile attack is one of the first choices to be considered. To bring the war to the enemy's territories is an effective means of deterrence. This can be done through missile strikes against its military bases, its warships in the oceans, and its supply lines. This is why the PLA's study of dealing with aircraft carrier groups is largely based on how to conduct missile attacks. Certainly there will be a considerable lag before the PLA can acquire such a capability that poses a real threat to the carrier groups. Yet the determination is there and the tactic is seriously researched, probably encouraged by the result of an alleged computer simulation by the US Department of Defence, which found that the PLA won a sea battle against the US using a concentrated missile attack. In this decade and the next, the PLA will try to enhance missile capabilities against possible US intervention in the Taiwan Strait. New generations of accurate long-range missiles will be developed to execute a Thoms Hawk [Tomahawk?] warfare. At the same time countermeasures are being formulated against the Theatre Missile Defence systems aimed at neutralising the PLA's missile capability.⁵⁹

The effort to increase the conventional capability of China's Strategic Missile Force (SMF) has thus been a top priority in the PLA's preparation for a RMA-type of war. Maintaining a relatively high level of missile threat is regarded as the one feasible means to compensate for China's inferior offensive capabilities. As the PLA's other strike capabilities by the navy and air force are weak and short, employment of conventional missiles becomes one of its few deterrents

⁵⁶ Lu Huilin, "Zhixinxiqun" (Counter information dominance), *Journal of the PLA National University*, no. , 1999, 35.

⁵⁷ Hao Chunxiang, *Xinjun geminlu* (On RMA), Beijing: The PLA Academy of Military Science Press, 1997, p. 16.

⁵⁸ Thomas Christensen, p. 2.

⁵⁹ The PLA will quietly increase the number of long-range delivery systems and warheads. It will also step up the R&D efforts for multiple warheads, re-entry technology, and deployment. This will be an area where an action-reaction arms race will intensify.

against a major power.⁶⁰ For instance, at the initial stage of a war across the Taiwan Strait, the PLA will unlikely engage the opponent in an airsuperiority struggle or a pitched naval battle. This may not just be due to the PLA's shortage of fourth generation aircraft and modern warships. Launching pinpoint missiles is less threatening politically and strategically than direct personnel engagement. At the same time, it both reduces the human losses for the PLA, as it creates a higher psychological impact. Moreover, missile launches are more manageable, as they can be stopped abruptly, while still threatening the paralysis of carefully selected military targets in Taiwan.⁶¹ This is advantageous for China in that it can slow the escalation of war and save it from direct confrontation with a superpower.

Accordingly, the SMF has in the past few years made serious efforts to formulate a new set of guidelines and concepts for "future missile warfare". This includes research on improving the terminal accuracy and on countering the tactics and style of a potential enemy's attack. The importance of these efforts is elaborated in a research report of the PLA National Defence University:

The PLA's conventional missiles will be used exclusively against the enemy's key military targets, which the weapons of other services cannot reach. These targets include the communications hubs, weapons delivery platforms, and most practically, the aircraft carrier battle groups. Since these systems are under heavy protection, the demand for the conventional missiles is thus very high. Moreover, how to use these missiles is a matter of military art involving the optimum timing and smart selection of targets.⁶²

Secondly, the use of conventional missile units of the SMF has been highlighted by the PLA's emphasis on united warfare. Traditionally, however, the SMF has largely confined its war doctrines and training programs to itself, given the nature of nuclear weapons and warfare. United campaigns involving the SMF with other services have never been a priority in the PLA's war preparation. Technological improvement of conventional missiles has made the SMF a useful tactical offensive force and, thus, made it possible for it to join other services in likely war scenarios. For instance, the missile attack against an enemy's C4IRS centres and airfields is seen to be conducive to the air force's efforts to achieve air superiority. Since training for united campaigns is currently prioritized for the joint exercises of the Army, the Navy and the Air Force, the SMF has been ordered by the CMC to formulate protocols for its participation. In effect the officers from the SMF are required to join the headquarters of united campaigns in each war zone, a departure from past practice. Now the SMF's coordination in such war efforts is seen as crucial to the achievement of victory.

The launch of conventional missiles in March 1996, codenamed "Strait 96 Number One", was the first known case of the SMF's participation in a large joint military exercise at the campaign level. The early timing of missile firing, in relations to other services in the exercise, seems to indicate that ballistic missiles would be used in the initial stage of a conflict in preparation for air

⁶⁰ You Ji, "Nuclear Power in the Post-Cold War Era: the Development of China's Nuclear Strategy", *Comparative Strategy*, Vol. 18, No. 3, August 1999, pp. 245-259.

⁶¹ Ibid.

⁶² Dong Xuebin, "Dier paobin zaifandi lianhe zuozhan yunyong zhong ying bawo de wenti" (The issues that the SMF must resolve in frustrating the enemy's united offensive), *The Journal of the PLA National Defence University*, no. 5, 1997, pp. 47-49.

strikes and amphibious assault. Moreover, during the exercise the missiles were fired from at least two widely dispersed units. This may be a purposeful design to test the PLA's C3 effectiveness.⁶³

Parallel to the PLA's efforts to enhance its missile attack capabilities is China's own theatre missile defence (TMD) program. To China, TMD is a grave threat to its military security in that it is a weapons system that may potentially neutralise part of China's strategic deterrent. The TMD system is regarded as an integral component of the RMA type of warfare. Politically, TMD is, like SDI, a symbol of the extension of Cold War, and signals a redefined power relationship in the Far East. An effective TMD cannot leave any geographic holes in its network. Therefore, it requires strengthened military ties between the US and its allies.⁶⁴ Technologically, TMD stimulates the PLA missile development in several aspects. Firstly, it requires the PLA to increase its missile stock substantially in order for it to launch a saturation attack. One important step in this regard is the quickened pace of developing cruise missiles that are more capable of penetrating the enemy's missile defence. Secondly, it galvanises the PLA to lift the general level of missile technology so as to evade the TMD interception. This requires a number of key technologies: enhanced electronic warfare capability, e.g. installation of sophisticated guidance systems such as IR/laser imaging guidance and active/passive guidance systems, and ECCM and on-board jammers; stealthy features; advanced solid fuelled motors and composite ramjet engines.⁶⁵ Thirdly, TMD forces the PLA to increase the speed of its missiles and develop more supersonic missiles in order to outpace the interceptors. The PLA is, in fact, not overly concerned about a TMD network, because at the current technological level, it is a lot more expensive to develop a workable missile defence system than to simply overload it with additional missiles. PLA analysts calculate the ratio to be 6 to 1, and come to the conclusion that China is capable of overwhelming any missile defence systems in the Far East with its concentrated launches.⁶⁶ This is especially true in a situation in the Taiwan Strait. The short geographic distance can give the armed forces in Taiwan only a few minutes of early warning time against incoming cruise missiles, causing observers to seriously question the reliability of a TMD system.

Obstacles to a RMA-Ready PLA

Even with a proper understanding of the RMA achieved, PLA leaders still confront a tremendous task in navigating the policy making process. Political consensus at the apex of power does not mean automatic removal of systemic constraints, bureaucratic barriers, existing vested interests, and budgetary limitations in restructuring force components, re-sequencing weapons R&D and equipping priorities, and re-formulating specific war plans. Any single factor may not frustrate the entire effort, but together they may pose key obstacles to a successful transition of the PLA to an RMA-ready force.

⁶³ Gerardi, Greg, and Fisher, Richard, "China's Missile Tests Show More Muscle", *Jane's Intelligence Review*, March 1997, p. 127.

⁶⁴ Robert Manning and James Pryztup, "Asia's Transition Diplomacy: Hedging against Futureshock", *Survival*, Vol. 41, no. 3, 1999, p. 59.

⁶⁵ Wang Jianmin and Zhang Zuocheng, "The fast growth of China's cruise missile technology", *China Aerospace*, no. 9, 1996, pp. 12-17.

⁶⁶ Interview with China's defence analysts in Beijing in January 2000.

Systemic constraints originate in China's social and political system. The difference between the industrial and post-industrial age lies in the fact that, with huge investment and transfer of technology, one nation may achieve an industrialised society relatively easily. Yet in the IT age, one nation has to acquire knowledge power by itself before it can be transformed into a true "intelligence society", which constitutes the necessary foundation of a RMA military. However, an intelligence society must first of all be an open society. A closed society kills human potential for imagination and innovation. An authoritarian system can do this easily, as it imposes many taboos in the political and academic discourse. Currently, China is slowly opening itself up and its state structure is much less rigid. But the constraints are entrenched and may well be there for a long time to come. This will surely undermine the nation's creativity.

Related to this factor of the political system is the factor of vested bureaucratic interests that adversely affect the transformation process. Due to the limit of space, the paper can list only one example to illustrate this. A RMA type military dictates a simple but effective command and control structure. Under this principle, the PLA has to overhaul its cumbersome organizational make-up. One thing it can do is to remove the layer of command immediately under the CMC, namely, the seven military regions. This layer serves both administrative and operational functions, as it is in charge of both field armies and garrison troops. Yet its administrative functions often confuse operational functions, resulting in delays of operational orders from above and combat information from below. Politically, it also contributes to regionalism in China. Even before the RMA was discussed in the mid-1980s, the PLA high command planned to transform each military region into a "strategic area direction force" whose headquarters assumed operational command only. This direction force was composed of field armies, but left the administrative functions, such as the command over garrison troops, to other agencies. So the CMC's relations with the area direction forces, their subordinate group armies, and the basic campaign units (divisions/brigades) would be clearer and more direct. Yet senior officers at this level were a powerful political force that opposed the reform. They argued that military regions, as a level of administration, performed important political functions, namely securing social stability in their regions. In addition, the military regions were in operational charge of the units of other services in the area. Without this structure, it would be difficult for the four services to be placed under a unified regional command, as the area direction forces were basically ground force units. These arguments indeed played a key role in shelving the proposed reform in the late 1980s.⁶⁷ When the RMA became a new guide for China's military reform in the late 1990s, this proposal was put forward again, as an important measure to trim the PLA command structure and ground forces. However, the resistance has been strong and the debate lingers on. If the reform can eventually be carried out, this would mark major progress for the PLA in laying down a necessary infrastructure for increased efficiency. However, the outcome is far from certain at the moment of writing.

China's weak technological foundation represents an insurmountable obstacle for the PLA to launch substantial RMA reforms. Without sufficient technologies in telecommunications, new materials, and computer science, a hi-tech military only stands on sand. For instance, without a fully developed space industry and real time command and control, reconnaissance and surveillance cannot be achieved; precision strike is beyond reach. Manufacturing industries are

⁶⁷ Ian Wilson and You Ji, "Leadership by 'Lines': China's Unresolved Succession", *Problems of Communism*, Vol. 39, January 1990, pp. 28-44.

also of great importance for making necessary equipment for a hi-tech military. China's defence scientists can design first-rate laser guns, missile navigation devices and nuclear submarines, but its basic industries cannot manufacture them. Indeed, advanced hardware is the beginning point for launching the RMA. If a military does not have enough fourth generation aircraft, integrated air defence systems and sophisticated naval ships, it cannot qualify as a RMA force. Moreover, military technology is based on civilian technology, which is the brain-child of basic science. China is backward in all of these areas. Although the Chinese are making accelerated progress in industrialisation, it will take a significant amount of time for them to build a thick civilian industrial foundation. Only from there can China develop the sophisticated military technologies necessary to improve the PLA's overall quality of hardware.

Limited funding is another formidable problem. A RMA type military does not come cheaply. Despite China's record increase in defence budgets, there is a huge gap between what is needed and what is available. Each year Chinese scientists produce a good number of weapons designs, but many of them have to be put away because there is no money for them to be thoroughly tested. Those that do enter laboratory trials may be dropped later because funding is so tight that it is impossible for them to get to the stage of series production.⁶⁸ The available resources decide the pace, direction and consequences of the RMA effort. Therefore for China, which is resources poor and which faces a quickly expanding economy, the RMA cannot take top priority in the leadership's consideration. This means that the PLA's RMA dream will remain unrealised for some time to come.

Although the PLA focuses on its transformation to a military of intelligence, there is a major discrepancy in the desired goal and an actual bridge towards it. One visible hindrance is the make-up of the officer corps. A key difference between the PLA today and the PLA of the past lies in the fact that 90 percent of its officers have tertiary qualifications.⁶⁹ Yet, while this figure is impressive, it can do little to push forward the course of transforming the PLA along the RMA lines in the short run. We need to analyse it further to arrive at some useful understanding. First, it is true that most officers at regiment level or above have tertiary qualifications, but over half of them acquired the qualifications in non-military or non-technological areas. They usually obtain degrees in personnel management, legal studies, political education, and public administration through correspondence courses and self-learning processes. These courses are easy to pass, but are less relevant to the advancement of the PLA's RMA transformation. On the whole only 20 percent of PLA officers graduate from tertiary institutions of science and technology. Therefore, most officers cannot handle hi-tech equipment and information systems, and it is beyond their ken to solve real technological problems. This has already hampered the implementation of the PLA's new hi-tech centered training program.⁷⁰ Secondly, since the majority of enlisted personnel are from the countryside where basic education is inadequate, lower middle-school

⁶⁸ According to a senior military scientist, the ratio of the three categories (design, lab test and production) is one-third each. He also informed me that China was able to launch manned-satellite long time ago, perhaps the 1980s. But lack of funding has delayed the project by almost two decades.

⁶⁹ Among the PLA's 600,000 officers, 90 percent have higher education qualifications; 20,000 officers have Masters degrees and over 4,000 officers have Doctoral degrees. Wu Jianhua, "Wo jun zhonggaoji nianqin zhihui ganbu baiyang de kaocha yu jishi" (A Review of the Promotion of Young Senior Officers in our Army and its Lessons), *Guofang daxue xuebao* (Journal of the PLA National Defence University), No. 1, 2000, p. 51.

⁷⁰ Bao Chunliang, "Jiefangjun ren yuan suzhi de bianhua", *Dongya jikan* (East Asia Quarterly), vol. 31, no. 2, 2000, p. 51.

education is the best they can receive. This situation may endure for some time. As a result, a high percentage of soldiers are computer illiterates and cannot handle hi-tech equipment.

In addition to the barriers mentioned above, the PLA has to deal with the legacies of the past if it can successfully move in the direction set by the RMA standard. These legacies are wide ranging. For instance, the old mentality that people's initiative is more important than the power of hardware is still quite evident among the officers and soldiers. The PLA's victory in the past was largely won as an inferior army. This creates a tendency that exaggerates the role of tactics and the personal courage vis-à-vis advanced hardware. Although PLA commanders realise the danger of such tendency when dealing with a powerful enemy that possesses both good tactics and hardware, the problem has not been adequately addressed for several reasons. First, as the PLA's inventory will remain obsolete for the foreseeable future, it is damaging to the moral of soldiers if the hardware factor is emphasized. Secondly, to PLA commanders, tactics are more important for a weak military than any other thing. One of the PLA's traditional tactics is to concentrate large numbers of soldiers to encircle a small number of the enemy and destroy it. However, there is a serious question PLA commanders cannot answer: whether this is still possible in a RMA type of war. No matter what answer they may come up with, their mental tendency to try to outsmart the enemy can be a trap because the old tactics may no longer be applicable to the emerging battlefield environment. As some PLA analysts point out, the focus of tactics is shifting from numerical strength to information superiority.⁷¹ This shift is related to another legacy of the PLA that can be very harmful, namely the inertia in its training programs. For instance, the PLA basic units still place a high emphasis on night combat in training, thinking that darkness can provide good cover for a weak military. Yet they are not adequately reminded that darkness is no longer the weakness of an enemy that has powerful night vision equipment.

In a way, none of the above-mentioned obstacles are insurmountable. Mentality and legacies can change eventually, as the original conditions of their existence become very different. Given time, weak technological foundation can also change. China's civilian hi-tech industries have been growing at an unprecedented pace and will gradually deliver to the military more and more badly needed technologies. The shortage of the military budget can also be addressed, as the economy improves. Certainly, all this takes time to take effect. At the moment the most difficult barrier is China's rigid political system, which cannot be reformed in a natural way. As a result, the resistance to a fundamental overhaul of the PLA's force structure will not be easily overcome because the vested bureaucratic interests deeply rooted in the rigid system cannot be easily countered. Fortunately for the PLA, the RMA is still in its initial stage of development. Twenty years may be a long time for China and the PLA to change. It seems that the Party and military leadership are committed to the transformation of the PLA along the RMA lines. Whether it can finally accomplish the mission is anyone's guess.

Conclusion

There is no doubt that the RMA has inspired the PLA to formulate its long-term modernisation guideline according to a new set of rules. To the PLA, the RMA is the world standard and development formula for a powerful military, one that it cannot afford to ignore. Indeed, it is the

⁷¹ *Zhongguo guofangbao* (The newspaper of the national defence), 3 December 2001.

very fact that China has little capability to cope with the RMA type of war that stimulates the PLA to study the RMA and to apply its principles wherever possible. To the Chinese leadership, the danger of a RMA type war against China does not lie in its effect of mass destruction in military terms, for the time being, but its political consequences in destabilising the country's social stability and government. This is where the CCP is very worried and has taken measures of self-protection. In the next few decades PLA watchers will see continuing reforms within the PLA, guided by the RMA concept. The PLA's C⁴I systems will gradually be streamlined and digitalised. Its force size will be significantly trimmed and force components restructured to allow more space for new specialised arms of service to emerge. Military R&D programs will put great emphasis on the development of new concept weapons. National defence strategy, campaign tactics and combat principles of different services will be under constant review to track the latest innovations of the major military powers. In short, the PLA will gradually become more open, flexible and forward leaning. As a result, it will become more professional and hi-tech oriented.

To the PLA, rectifying doctrinal defects is, at the moment, more important in its long-term modernisation than the immediate possession of modern combat hardware. Embracing the RMA and trying to put it into practice may have set the PLA in the right direction. However, adopting a correct strategic guideline does not guarantee that the PLA will succeed in transforming itself eventually into a world class fighting force. People may question whether the Chinese, despite their ability to mimic American attitudes, can also materialize RMA; the answer is not at all obvious.⁷² If the Soviet failure in its technological race with the US tells us anything, it is that a closed socio-political system may stifle the imagination of the scientific community and doom the long-term potential of the nation. Therefore, the biggest challenge to China's search for major power status may not be the current backwardness of its technology but the rigidity of its political system.

⁷² Ahrari, 1997, p. 473.